

Green is directed to an electrolyte suitable for batteries, supercapacitors, electrochromic windows and displays. This reference discloses an electrolyte comprising a composite of a polymer and a molten salt electrolyte immobilized within a polymer such as polyethylene oxide. This polymer is not an associated body formed by coordination bonding or hydrogen bonding, as alleged by the Examiner in the Office Action.<sup>1</sup> The electrolyte obtained in Green is not a gel, but is a flexible film. Clearly, this reference cannot anticipate the present invention.

GB '504 cannot provide the teachings lacking in Green. The Examiner cited this reference for a teaching of a solid polyacrylamide electrolyte that includes an amine-substituted cyclohexane ring as a plasticizer. Even if, assumed, arguendo, that GB '504 contains the alleged teaching, this reference fails to disclose or suggest a gelling agent that is forming an associated body by intermolecular bonding. Therefore, the presently claimed invention is clearly patentable over the combination of Green and GB '504.

Ue and Williams teach using non-polymeric gelling agents to "hold in" the liquid electrolyte, where the gelling agents and the electrolyte are dissolved in a solvent, heated and then cooled down to settle. Green discloses an electrolyte as a composite of a polymer and a molten salt, where the electrolyte is prepared by mixing a polymer dissolved in an organic solvent and a molten salt, with the mixture being cast on a glass substrate to

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<sup>1/</sup>In response to the arguments presented in the last-filed Amendment, the Examiner alleged that the limitation regarding the bonding in claim 1 does not affect the patentability of the product claims, since this limitation only pertains to the process by which the product is made. The Examiner will note that this limitation does pertain to the product in that it specifies that the gelling agent is an associated body held together by intermolecular bonding, i.e., the limitation defines the structure of the gelling agent. However, solely to simplify matters, Applicants have amended claim 1 to clarify that the intermolecular bonding defines the product and not the process by which it is made.

form a film. Clearly, it would not have been obvious to a person skilled in the art to prepare a gel electrolyte using an ionically conductive material that is a liquid at working temperature (a molten salt) in place of a liquid electrolyte (electrolytic solution) with a gelling agent that gels forming an associated body via intermolecular bonding (a non-polymeric gelling agent).

As a matter of law, the prior art must provide a reasonable expectation that the proposed modification will succeed. The Examiner is required to show that the prior art not only suggests doing what the inventor has done, but also that the art provides the required expectation of succeeding in that endeavor. See In re Dow. Chem., 5 U.S.P.Q.2d (BNA) 1529, 1531 (Fed. Cir. 1988). (“Both the suggestion and the expectation of success must be founded in the prior art, not in applicant’s disclosure”).

It is respectfully submitted that the Examiner has not shown, and Applicants have not found, one iota of disclosure in any of the cited references that would provide the requisite expectation of success. In fact, Applicants submit that it would not have been possible to predict that a gelling agent that gels forming an associated body via intermolecular bonding can gel in a molten salt without any or with only little organic solvent present based on the teachings of Ue, Williams and Green. Furthermore, the Examiner will note that the conductivity of the gel electrolyte of the present invention is considerably higher than that in Green, as shown in Fig. 5. Accordingly, as a matter of law, neither Ue nor Williams can be combined with Green to render the presently claimed invention unpatentable.

With respect to JP '836, Applicants respectfully submit that this document is not prior art. The subject application claims priority from Japanese Patent Application No. 10-313938, filed on October 19, 1998. The filing date of the priority application is clearly earlier than the July 9, 1999 publication date of JP '836. Applicants will shortly submit a sworn translation of JP 10-313938 in conformity with 37 C.F.R. § 1.55 to perfect this priority claim. Therefore, the rejection over JP '836 should be withdrawn.

Even if JP '836 were not prior art, Applicants again respectfully submit that this document discloses the electrolyte that can be a metal salt, which is solid, not liquid, at room temperature, such as a metal iodide, a quaternary ammonium iodide, a metal bromide, a quaternary ammonium bromide and sulfur compounds. It is understood that other useful electrolytes can include molten electrolytes which are liquid at room temperature. However, the gel electrolyte is not prepared by a gelling agent forming a fibrous associated body to entrap the liquid salts. Rather, the specification in JP '836 teaches the gel electrolyte is prepared by mixing the gelling agent, the electrolyte and a solvent. The mixture is heated to form a solution and then cooled. Further, the preferred electrolyte concentration is from 0.05 to 1.5 M. These amounts are far lower than the amounts typically employed in the present invention and would result in a less conductive product. Clearly, JP '836 cannot affect the patentability of the presently claimed invention.

Accordingly, it is submitted that none of the references, whether considered alone or in combination, discloses or suggests the present claimed invention nor renders it unpatentable. Accordingly, it is respectfully requested that the claims be allowed and that the case be passed to issue.

This Amendment After Final Rejection should be entered because it places the case in allowable form. Alternatively, it places the case in better form for possible appeal.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,

  
Attorney for Applicants

Registration No. 48,512

FITZPATRICK, CELLA, HARPER & SCINTO  
30 Rockefeller Plaza  
New York, New York 10112-3801  
Facsimile: (212) 218-2200

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## APPENDIX

Application No. 09/417,832  
Attorney Docket No. 03500.013929

### IN THE CLAIMS:

Claim 1 has been amended as follows:

1. (Twice Amended) A gel electrolyte containing at least a gelling agent and an ionically conductive material which is liquid at working temperature, wherein said gelling agent is forming an [gels by forming a fibrous] associated body via intermolecular bonding.

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